THURSDAY, NOVEMBER 9, 1876

FUNGUS DISEASE OF INDIA

The Fungus Disease of India: a Report of Observations. By F. R. Lewis, M.B., and D. D. Cunningham, M.B. (Calcutta: Government Printing Office, 1875.)

FEW questions are more perplexing than the relations of fungi to different diseases to which the animal world is subject. On the one hand the most exaggerated and ill-founded theories have been put forth, which have tended to cause the most senseless alarm, while on the other hand their agency has been altogether denied, or if at all allowed, restricted to subjects already in a depressed state of health, and therefore as merely availing themselves of a fitting nidus for their development. The truth probably lies between the two extremes, and if the analogy of the vegetable kingdom be allowed to have any weight, it is difficult, after what we know of the propagation of the potato-murrain by means of zoospores in perfectly healthy individuals, to deny the possibility of infection without a previous morbid state. The advocates, indeed, of these views, at once cut off all argument by the assertion that the potato-plant, by reason of long propagation by means of tubers, has become essentially unhealthy, but the same might be asserted of members of the animal kingdom subject to disease, as indeed is the case with that to which silkworms fall victims, by reason of inoculation with the spores of *Botrytis bassiana.* The real point, however, is whether even in unhealthy subjects, fungi merely find a proper nidus for their growth, or whether they may induce disease in these subjects, and no question in pathology can be conceived of greater importance. It at least seems quite certain that a gangrenous state of wounds may arise from the access of fungoid germs from the air, and that proper means to prevent their access, or to destroy their vitality, are effectual.

The work, therefore, which bears the title given above, is of unusual interest, relating as it does to one of the most formidable maladies to which the human frame is subject, and it demands very patient observation, as the authors have not only paid the greatest attention to questions of the kind, having had a special preparation for such investigations before entering upon their study, but, what is unfortunately of too great rarity amongst persons who have written on such subjects, are thoroughly acquainted with the nature of that part of the vegetable kingdom which is called in question.

It is not necessary here to describe the peculiar features of the disease, which would take us far beyond our limits, farther than to state that it appears under three different forms, in one of which black sclerotioid bodies of various sizes, from a grain of sand to a small walnut, excavate hollows in the bones, or are ejected with various sanious matters from the wounds, and it is to this form that the observations have a special relation. In the article in the *Intellectual Observer,* Nov. 1862, by the writer of this notice, which was founded on observations communicated by Dr. H. J. Carter, it is stated that the figure *d*, p. 256, represents the natural state of the red fungus, *Chionyphe Carteri,* springing from particles of the black fungus scattered over rice paste. It should seem, however, that there is some doubt about this as our authors deny that the Chionyphe[1] has ever been raised from the black fungus. It is at least certain that all attempts of our authors to raise it from the Sclerotioid mass have failed, and it is supposed that the Chionyphe was an accidental growth from macerated specimens of fragments of either the black or pink form of the disease. It is doubtful whether any great weight can be laid on the pink colour. Nothing is more common in this country than for pink spots to occur on paste or decaying fungi, and these pink gelatinous specks are capable of propagation, as is also the case with the bright blue specks which occur in similar situations, as I have myself proved, and of which I preserve specimens. The so-called blood-rain belongs to the same category. Unfortunately it has not yet been proved that these bodies are capable of development into higher forms. The real point is whether these sclerotioid bodies are really of a fungoid nature at all, a point which is worthy of mature consideration.

And here our authors very properly call attention to the fungoid forms which appear in the myeline of Virchow. The observations are so important that it is well to give them textually:—A development of myeline is especially prone to occur where portions of the fatty matter, roe-like masses, &c., freshly removed from an alcoholic preparation, are subjected to the action of liquor potassæ. The multifarious and highly complex forms of tubes, filaments, globules, and cysts, which may frequently be observed to become developed, shooting out and, as it were, growing from the globules and aggregations of fatty matter, are wonderful, and such that they could hardly be believed to owe their origin to any such process or material, were not their development distinctly traceable through all its stages.

"From the extremely organised nature of their appearance they are, as the accompanying figure will show, peculiarly liable to be mistaken for fungal growths, especially by those who are unused to the practical study of such bodies and to the various appearances presented by complex oily bodies, and it is necessary that very great caution should be exercised in the interpretations of such phenomena."

This is clearly of the utmost importance, and cannot be too thoughtfully considered. The calcospherites of Prof. Harting, the concretions of Mr. Raines, and the curious specimens of dentine exhibited at Norwich, in 1868, so similar to cellular tissue as to deceive the most instructed who were not acquainted with their orgin, belong to the same class of bodies.

We are not surprised, then, after these considerations, the futile attempts to raise the Chionyphe from the Sclerotioid bodies, and the mode of origin of the fungus in other cases, that our authors have arrived at the conclusion that the Fungus-foot of India is not due to any fungus growth.

The roe-like bodies which occur in the pale variety of the disease are shown to be fat in various modified forms; the pink particles were determined to be pigmented concretions, while the black masses consist of degenerated tissues mixed to a greater or less extent with black pig-

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[1] The genus Chionyphe, it should be observed, does not grow on snow, but on wheat, or other vegetables that have been buried under snow.

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ment and fungoid filaments. These fungoid filaments would not be coaxed by any treatment into the development of fruit, and their nature, therefore, must still remain doubtful.

Our authors conclude that it is more reasonable to infer that localised spots in the tissues undergo a degenerative change into a substance peculiarly adapted to the development of filamentous growths, the origin of which, in situations where no spore could penetrate, must remain matter of perplexity.

M. J. BERKELEY

THE ADMINISTRATION OF PATENT LAWS IN ENGLAND

Abstract of Reported Cases relating to Letters Patent for Inventions. By T. M. Goodeve, M.A. Barrister-at-Law, and Lecturer on Applied Mechanics at the Royal School of Mines. (London: Henry Sweet, 1876.)

THE subject of the Patent Laws of this country which is now upon its trial, is one which largely affects the interests of scientific men in almost every branch of research, for in a great majority of cases a patent is the only channel through which the inventor of a good thing, which may confer inestimable benefits upon mankind, has any chance of being remunerated.

There is, at the present time, great diversity of opinion upon the question whether the Patent Laws should exist at all or be abolished, and there is also a diversity of opinion among men of science whether a scientific invention designed for scientific purposes ought to be patented, or freely given to the world. It is universally admitted, however, that some mode of rewarding the individual whose ingenuity and perseverance have enabled him to discover a new invention ought to be in existence; but, until some better system than that of patents is established the laws must be dealt with as they are. With regard to purely scientific inventions it is impossible to draw a hard and fast line between those useful alone to science and others upon which large commercial industries may be built. It often happens in the course of scientific research that an idea is struck upon, which, while aiding the immediate inquiry, is at the same time the solution of some great commercial problem, out of which fortunes may be made. The history of the science of Chemistry alone abounds with innumerable instances of the truth of this, and assuredly the original inventor ought to share in benefits derived from what could not have existed apart from his discovery.

The *principle* of patents is in itself good, because it provides that the reward of the inventor is regulated by and is proportionate to the utility of the thing invented, and to the amount of benefit derived from it by the community; and, at the same time, that reward is at the expense of that portion of the public who use the invention, and not, as in alternative schemes, at the cost of the public at large. The carrying of that principle into practice, however, is beset with so many difficulties, and the administration of the laws relating to it is so very defective, that a patent which is worth anything, can only be maintained at the cost of endless litigation, which often swamps all possible profits, and with a few exceptions lands the inventor in a large sum out of pocket.

Much of this would be saved if inventors had a more accurate knowledge of the Patent Laws, and knew something of the principles upon which they are administered in the tribunals of the land. Many a patent is taken out for an invention which is legally disqualified from being the subject-matter of a patent, and every day letters of patent are being granted for things which have been invented and patented over and over again. They are never refused on this ground, and the mischief is not discovered until the expenses of an action at law have been incurred.

Prof. Goodeve's work, though not a treatise on the Law of Patents, gives to the reader a remarkably clear insight into that law and its administration, by enabling him to understand the reasons which must guide a court or jury in their decisions upon patent cases.

From the vast medley of reported cases scattered throughout the archives of the Courts, the author has made a selection of abstracts chosen with great judgment on account of the characteristic nature of the principles involved, and, by the omission of all matter extraneous to those principles, has put forward the real points at issue in a very prominent and instructive manner. In each case the essential pleadings are given, and the inventions are described as nearly as possible in the language of the specification. The claims are stated, with the evidence adduced in their support at the trial, and both the direction of the judge and the finding of the jury are given in a clear and condensed form.

Many of the cases quoted in Prof. Goodeve's book involve points of high scientific interest; and, apart from its obvious value as a work of legal reference, it will be found to be a useful handbook to the inventor, and not without some considerable interest to the general scientific reader.

C. W. C.

LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

Sumner's Method at Sea

IN NATURE for August 24 you were good enough to review, in very favourable terms, Sir William Thomson's recently published book of tables for facilitating Sumner's Method of navigation. Since then you republished an attack on that method by the Astronomer Royal, which he made in the form of a letter to Prof. Stokes, after Sir William Thomson had communicated to the Royal Society the plan upon which his tables are based. Will you allow me, as one who took an active part in preparing Sir W. Thomson's book for publication, and who has had a good deal of practical experience of his method, to endeavour to reply shortly to the criticisms of the Astronomer Royal?

In publishing Sir G. B. Airy's letter, Prof. Stokes appended a note which was really a complete answer to the objections brought forward, and this was further enforced by remarks made by Sir W. Thomson in a second communication to the Royal Society (*Proc.*, June, 1871). As, however, the subject was but briefly treated in these communications, and the Astronomer Royal's letter has been republished at his own request, it may not perhaps be useless to go into the question in somewhat greater detail.

After stating the geometrical conditions under which the Sumner line, or *locus* of the ship's position is obtained from a single observation of altitude and time, the Astronomer Royal points out the very obvious truth that the accuracy of the position of the line depends on the accuracy with which Greenwich time can be

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